CONDIT HYDROELECTRIC PROJECT

FERC NO. 2342

REMOVAL PLAN SUMMARY

INTRODUCTION

Parties to the Condit Hydroelectric Project Settlement Agreement ("Settlement Agreement") reached agreement on a proposed removal plan for Condit Dam and demolition and removal of all Condit Hydroelectric Project ("Project") facilities with the exception of the Project's powerhouse. The proposed removal plan described as the "Selected Approach" in the Condit Hydroelectric :Project Removal Summary Report (May 1998) submitted to the Commission in 1998 as supplemented by removal activities and cost modifications listed in the Cost Removal Worksheet, a copy of which is attached hereto, collectively are the "Removal Plan."

This document, the "Removal Plan Summary," describes the basic elements of the proposed Removal Plan and includes a schedule of the removal activities. The demolition and removal of Condit Dam and other Project facilities, except for the Project powerhouse, are estimated to take one (1) year. In accordance with the Settlement Agreement, PacifiCorp's contribution to planning, engineering, design, mobilization, demobilization, construction and demolition costs for Project removal in accordance with the Removal Plan shall not exceed $13,650,000 (1999 dollars). In the event of any conflict between this Removal Plan Summary and the Settlement Agreement or the Removal Plan, the Settlement Agreement and the Removal Plan shall control.

The method for Project removal agreed upon in the Settlement Agreement was not reviewed in the Commission's October 1996 Final Environmental Impact Statement. The Settlement Agreement contemplates that before the Commission takes final action on PacifiCorp's application for the Amended License that the Commission needs to prepare a supplement to the October 1996 Final Environmental Impact Statement, engage in consultation as appropriate under Section 7 of the Endangered Species Act, and take other actions as appropriate.

REMOVAL PLAN ELEMENTS

Dam Removal.

The removal of Condit Dam would be accomplished by excavating a drain tunnel through the concrete base of the dam to rapidly drain the reservoir and to allow the dam to be removed in quarried blocks of concrete using conventional construction techniques.

The drain tunnel is to be 12 feet high by 18 feet wide and would be excavated using drilling and explosives at the base of the dam, at elevation 174. The tunnel size is capable of passing 10,000 cfs. Concrete excavated from the tunnel would be transported to a spoil area adjacent to the dam by trucks that are loaded by a rough-terrain crane. An access road would be constructed to the existing spillway apron deck. The last 15 feet of the tunnel would be drilled and blasted, allowing the reservoir and impounded sediments to be sluiced through the tunnel, lowering the reservoir to stream level in about 6 hours.

Prior to this final tunnel blast, a barge mounted clamshell crane would be floated in front of the dam to excavate sediment and debris from the area in front of the projected tunnel hole-through. When the area has been sufficiently cleaned out, the crane and barge would be

removed from the reservoir and the final tunnel blast would be detonated to drain the reservoir. Should the tunnel plug with woody reservoir debris, measures will be taken to clear the jam.

To allow anadromous fish to pass the site during the dismantling of the dam, a series of protective fish pockets would be excavated in each of the walls of the tunnel to allow a place for fish to rest during their passage upstream.

Concrete excavation of the dam would proceed in the dry and start at the East End of the dam. Using drilling and explosives, concrete blocks with dimensions of 10 feet high by 4 feet deep by 6 feet wide would be removed with a highline yarder-type system to trucks for transport to the spoil area. The block size was selected to minimize the cost of excavation and hoist capacity, which would require average lifts of about 33,600 lbs.

Construction would proceed across the dam in a series of top slicing cuts at ten-foot vertical intervals. The (very top cut and the front and back faces of the dam in each cut would be drilled and blasted into blocks and loaded into trucks with an excavator and hauled off the dam. As the top slice cuts progress downward and the dam widens, the center section would be drilled and blasted into rubble much like a highway rock cut excavation. The concrete rubble would be loaded into trucks with an excavator and hauled off the dam. This procedure would significantly decrease the cost of concrete demolition.

As the top slice cuts across the top of the dam progress downwards below elevation 225, the existing river channel gets narrow and steep. At this point a crane would be set up on the spillway slab to hoist concrete from this lower area. As the excavation reaches the level of the drain tunnel, the center portion of the area adjacent to the tunnel would be excavated down to bedrock leaving sections of intact concrete along the edge of the tunnel and along the front and back faces of the dam to hold the water out. When the center section is completely excavated to

bedrock, the edge sections are blasted into blocks and hoisted out of the river channel. This should put the river down to its original channel. Lastly, the area around the drain tunnel is excavated in a similar method. This work must be scheduled during low river flows in order to perform a good job of removing the concrete from the footprint of the dam in this lower section.

An earlier proposal for Project removal called for a gate to be fitted to the dam drain tunnel to control releases. Based on subsequent studies of sediment removal and with the concurrence of involved parties, it was decided as reflected in the Condit Hydroelectric Project Removal Summary Report that a more rapid removal of the sediments was preferred.

Appurtenant Facilities Removal.

In addition to removing the concrete gravity dam including its Obermeyer crest spillway gate and other spillway and intake gates, demolition of the Project facilities also would involve removal of the upstream cofferdams, wood stave pipeline, steel surge tank, and the wooden and steel penstocks.

Upstream Cofferdams: Photographs and drawings show that the cofferdams used to divert and control water during the original construction of the dam were flooded when the reservoir was allowed to fill, and would require removal to return the site to preconstruction conditions. To remove these structures, it is envisioned that a road would be constructed from the top of the excavated concrete dam and would ramp down to area of the cofferdams. The cofferdams are expected to be at least partially exposed by the erosive flushing of the reservoir. Some blasting would probably be necessary to remove one of the cofferdams, since the photographs indicate that fill concrete was probably placed in one cofferdam in lieu of the puddled earthen materials shown on the original construction drawings. The concrete, stones and boulders, and timber members of the cofferdams would be excavated and trucked to the spoil area. The temporary

construction road would also allow access to the upstream area where logs and other debris have sunk to the bottom of the reservoir. Some of these logs would be removed, as necessary, to promote reservoir sediment erosion.

Surge Tank: The steel surge tank and its concrete foundations would be removed to eliminate a future public safety hazard. To allow demolition of the concrete foundation of the tank, drilling and blasting techniques would be used. The foundation and tank materials would be loaded into trucks and transported to the spoil area for burial.

Wood Stave Pipeline and Steel & Wood Penstocks: The existing 13.5 foot diameter, 5100 foot long wood stave pipeline and the 650 foot long steel and wood penstocks, would be removed along with their concrete foundations. All of these materials would be transported to the spoil area and buried. At the time of construction it may be economically feasible to re-cycle some of these materials, and transport them to an off site recycling firm. For example, the scrap steel from the penstock, surge tank, and steel bands and fittings of the wood stave pipeline could have value at the time of removal.

Site Preparations.

Because the dam is located in a steep area, room for construction-demolition adjacent to the dam is limited. It is proposed that a ten-acre area be purchased and used for a site setup and staging area, a borrow pit and a spoil area. Site setup facilities would include an office trailer, equipment parts vans, equipment fueling and maintenance station, an equipment parking area and an explosives magazine site.

It is estimated that two to three thousand cubic yards of fill material may be required for the construction of access roads to various areas of the project. This material could be removed from this spoil area and later back filled as the construction site is reclaimed.

A significant volume of waste materials would be generated from the demolition of the dam and associated facilities. Estimated quantities of some of these materials are listed as follows:

- Concrete - over 45,000 cubic yards (broken volume)
- Wood Pipe Staves - over 6,000 cubic yards stacked
- Steel - over 400 tons
- Woody Reservoir Debris - from drained reservoir area (unknown quantity)

Certainly, some of this material could be hauled off and recycled dependant on the market economics of recycling at the time of construction. A fairly large area would be required to store, sort and transport this material for recycling.

Access Road Construction.

One of the first activities of the project would be construction of an access road to the spillway slab below the dam to permit excavation of the reservoir drain tunnel located at the base of the dam. Access roads into the drained reservoir area would be used during removal of the cofferdams immediately upstream. Other access roads would be required for the removal of the 5100-foot long wood stave flowline.

REMOVAL PLAN SCHEDULE

An aggressive schedule has been developed to complete the dam removal project within one year. The attached schedule, Figure 1, shows the sequence and timing of the major tasks. Certain criteria have been used to develop the schedule and includes the following:

- Work that affects water quality and quantity should be performed after October 1st. (US Fish & Wildlife Service, 21 January 1998 memo)
- The diversion dam used in the original construction of the dam should be removed prior to May 1st to allow fish passage. (US Fish & Wildlife Service, 21 January 1998 memo)
- Excavation of the 12X18 ft. drain tunnel at the base of the dam and the removal of low level concrete in the old river channel must be performed during low river flows (July through November)

The success of this schedule is dependent upon many factors that are difficult to predict such as actual river flows and weather conditions that would be encountered and the impact of buried wood debris in the reservoir. If significant wood debris is encountered, the speed of sediment erosion could be reduced and additional time may be required to handle the debris and to keep the drain tunnel through the dam open.

REMOVAL PLAN CONSTRUCTION COSTS

Although the structural removal work and the flushing of trapped sediments in the reservoir would consist primarily of demolition, rather than construction, the work has been referred to in the Settlement Agreement as "construction" because construction contractors would perform the work. The Condit Hydroelectric Project Removal Summary Report (May 1998) prepared by an independent consultant identified removal elements and estimated construction costs of $10,420,000 (1998 dollars) for the "Selected Approach," including allowances for overhead and contingencies (15%), legal, administration and engineering (10%), and minor building permits (3%). With the assistance of another independent consultant, parties to the Settlement Agreement reviewed and adjusted both removal elements and construction costs. Based on that review, the Removal Costs Worksheet identifies removal elements and construction costs of $13,650,000 (1999 dollars) for the Selected Approach," including allowances for overhead (15%), legal, administration, and engineering (10%), and minor building permits (3%). The "Removal Cost Elements" total set forth in the Removal Cost Worksheet is the basis of "Construction Costs" set forth in Section 4.1.1 of the Settlement Agreement.